



MONITORING PLAN FOR COMMUNITY WATER SUPPLIES – DISINFECTANTS AND DISINFECTION BYPRODUCTS (DDBP)

Issued under authority of 1976 PA 399 and Administrative Rules, as amended. Administrative Rule R 325.10719i requires a water supply to develop a monitoring plan. This form is provided as a convenience to the water supply to develop the plan.

Water Supply Information

Supply Name	WSSN
Address	Population Served
City, State, Zip	County

Contacts – Water Supply

Name and Title	E-mail	() Telephone
Name and Title	E-mail	() Telephone
Name and Title	E-mail	() Telephone

Contacts – DEQ and Other

DEQ Drinking Water Analyst Name	E-mail	() Telephone
DEQ Drinking Water District Engineer Name	E-mail	() Telephone
Pollution Emergency Alerting System Information (PEAS) Call PEAS number if unable to contact DEQ staff.		1-800-292-4706 Telephone
Local Official	E-mail	() Telephone
Local Official	E-mail	() Telephone
Health Department	E-mail	() Telephone

Public Notification

Means of Public Notification		
Newspaper Name and City	E-mail	() Telephone
Radio/Television Name and Address or City	E-mail	() Telephone

Laboratory

Primary Laboratory Name	E-mail	() Telephone
Primary Lab Address, City, State, Zip		
Alternate Laboratory Name	E-mail	() Telephone
Alternate Lab Address, City, State, Zip		

DDBPR Monitoring Plan for WSSN _____(continued)

Measure Chlorine Residual (under normal operating conditions)

- ☐ Check if this supply serves water disinfected with chlorine or chloramines. The residual disinfectant level must be measured at the same time and the same location as each total coliform compliance sample (includes all routine AND repeat total coliform samples).

Monitor Total Trihalomethanes (TTHM) and Haloacetic Acids (HAA5)

TTHM and HAA5 Sample Sites and Monitoring Frequency

Site Code ¹ (DBP1, DBP2, etc)	Sample Site Address	Rationale for Selection	ROUTINE Monitoring Sample Every <input type="checkbox"/> 3rd Month <input type="checkbox"/> 1 Year	REDUCED Monitoring ² Sample Every <input type="checkbox"/> 3rd Month <input type="checkbox"/> 1 Year <input type="checkbox"/> 3rd Year
DBP__			<input type="checkbox"/> TTHM <input type="checkbox"/> HAA5	<input type="checkbox"/> TTHM <input type="checkbox"/> HAA5
DBP__			<input type="checkbox"/> TTHM <input type="checkbox"/> HAA5	<input type="checkbox"/> TTHM <input type="checkbox"/> HAA5
DBP__			<input type="checkbox"/> TTHM <input type="checkbox"/> HAA5	<input type="checkbox"/> TTHM <input type="checkbox"/> HAA5
DBP__			<input type="checkbox"/> TTHM <input type="checkbox"/> HAA5	<input type="checkbox"/> TTHM <input type="checkbox"/> HAA5
DBP__			<input type="checkbox"/> TTHM <input type="checkbox"/> HAA5	<input type="checkbox"/> TTHM <input type="checkbox"/> HAA5
DBP__			<input type="checkbox"/> TTHM <input type="checkbox"/> HAA5	<input type="checkbox"/> TTHM <input type="checkbox"/> HAA5

¹ Each Site Code is unique to a Sample Site Address. Contact the DEQ if a sample site is no longer available. The DEQ will help you select a new Sample Site Address and establish a new Site Code.

² Reduced monitoring can only be established after certain criteria are met. Complete this column only after consultation with the DEQ. Monitor according to the routine schedule unless a reduced schedule has been approved by the DEQ.

Peak historic month: _____ (month of highest byproduct formation, based on past results)

When monitoring:

- Every 1 year or every 3rd year, monitor during the peak historic month.
- Every 3rd month, check the group below that contains the peak historic month. Monitor during each of the months in the group.

<input type="checkbox"/> January, April, July, and October	(1 st month of each calendar quarter)
<input type="checkbox"/> February, May, August, and November	(2 nd month of each calendar quarter)
<input type="checkbox"/> March, June, September, and December	(3 rd month of each calendar quarter)

Monitor Bromate (under normal operating conditions)

- ☐ Check if this supply adds ozone. This supply must collect 1 sample per month for bromate at the entry point (plant tap) of each treatment plant that uses ozone. The DEQ may reduce frequency from monthly to quarterly if the bromate running annual average (RAA) is ≤ 0.0025 mg/L (milligrams per liter) (2.5 parts per billion [ppb]).

Schematic (optional)

- ☐ Check if a schematic is attached showing the sample sites in this monitoring plan.

TTHM and HAA5 Operational Evaluation

This supply must conduct an operational evaluation if either the TTHM or the HAA5 Operational Evaluation Level (OEL) exceeds the maximum contaminant level (MCL). This supply must submit the written report to the DEQ district office within 90 days after learning the result that causes the OEL to exceed the MCL. The OEL is an estimate of the following quarter's locational running annual average (LRAAs). $OEL = 2 \text{ previous quarters results} + \text{twice the current quarter result, all divided by 4.}$

TTHM and HAA5 Increased Monitoring

A supply monitoring less frequently than quarterly must begin quarterly monitoring at all sites if any TTHM or HAA5 result is above the MCL at any site. Compliance with the MCL will be determined at the end of four consecutive quarters, including the quarter that triggered increased monitoring.

Sample Site Plan Completed By

_____ Name	_____ Title	_____ Date
_____ Signature	_____ E-mail	() Telephone
_____ Water Supply Name	_____ County	_____ WSSN

Compliance Calculation Procedures

See page 4 of this plan.

Compliance Calculation Procedure

General

Where compliance is based on an RAA of monthly or quarterly samples or averages and the supply fails to monitor for TTHM, HAA5, or bromate, this failure will be treated as a monitoring violation for the entire period covered by the RAA.

All samples taken and analyzed from compliance sites must be included in determining compliance, even if that number is greater than the minimum required.

If any individual quarter's average will cause the RAA of that supply to exceed the MCL, the supply is out of compliance at the end of that quarter.

Chlorine

Chlorine maximum residual disinfectant level (MRDL) is 4.0 mg/L.

Compliance with the MRDL is based on an RAA, computed quarterly, of monthly averages of all measurements taken at the same place and time as total coliform compliance samples.

In cases where supplies switch between the use of chlorine and chloramines during the year, compliance will be based on all monitoring results of both chlorine and chloramines.

TTHM and HAA5

TTHM MCL is 0.080mg/L (80 ppb). HAA5 MCL is 0.060 mg/L (60 ppb).

Compliance with each MCL is based on the LRAA for TTHM and HAA5 at each location. If one location is out of compliance with the MCL, then the supply is out of compliance.

If monitoring annually or less frequently and no sample exceeds the MCL, the sample result for each monitoring location is considered the LRAA for that monitoring location. If a sample exceeds the MCL, the supply shall increase monitoring to a dual sample set at each location every 90 days and calculate compliance at the end of four quarters, including the quarter in which the sample exceeded the MCL.

If monitoring quarterly, the LRAA is calculated quarterly using results from each location. If the supply fails to complete four consecutive quarters of monitoring, compliance with the MCL will be based on the average of available data from the most recent four quarters. If the supply takes more than one sample per quarter at a monitoring location, an average of all samples taken in the quarter at that location will be used to determine the LRAA.

The supply is in violation of the MCL when the LRAA exceeds the MCL, based on four consecutive quarters of monitoring, or the LRAA calculated based on fewer than four quarters of data if the MCL would be exceeded regardless of the monitoring results of subsequent quarters. The supply is in violation of the monitoring requirements for each quarter that a result would be used in calculating an LRAA if the supply fails to monitor.

Bromate (for supplies using ozone)

Bromate MCL is 0.010 mg/L (10 ppb).

Compliance is based on an RAA of the most recent four quarters, computed quarterly, of monthly samples (or for months in which the supply takes more than one sample, the average of all samples taken during the month). If the average of samples covering any consecutive four-quarter period exceeds the MCL, the supply is in violation of the MCL and must notify the public, in addition to reporting to the DEQ. If a supply fails to complete 12 consecutive months of monitoring, compliance with the MCL for the last four-quarter compliance period is based on an average of the available data.

Control of Disinfection Byproduct Precursors – Total Organic Carbon (TOC)**Applicability:**

- ☐ Check if this supply uses conventional filtration to treat surface water or groundwater under the direct influence of surface water (including softening plants). Complete remainder of this form below.
- ☐ Check if this supply uses a method other than conventional filtration. This supply is not required to monitor for disinfection precursors (Total Organic Carbon - TOC). However, in order to qualify for reduced monitoring for disinfection byproducts, this water supply will monitor source water TOC monthly. With DEQ approval, this supply will monitor TOC every 3rd month after the TOC RAA is less than or equal to 4.0 mg/L, based on the most recent 4 quarters of monitoring. STOP HERE - the remainder of this form does not apply.

Sample Sites

- ☐ This supply will sample at each treatment plant using conventional filtration. Samples must be collected at the same time (may allow for the detention time in the treatment train between raw and finished water sampling points).

Sample for ...	At...	Further Describe the Specific Sample Site
Alkalinity	A point prior to any treatment	
Source water TOC		
Finished water TOC	The combined filter effluent no later than turbidity compliance point	

- ☐ This supply has more than 1 treatment plant and additional tables are attached.

Frequency

Monitor monthly unless reduced to quarterly by the DEQ (allowed if the treated water TOC RAA is < 2.0 mg/L for 2 consecutive years or < 1.0 mg/L for 1 year).

Treatment Technique

Compliance with the disinfection precursors' requirements is a treatment technique to control disinfection byproduct precursors or TOC, which is the medium for the formation of disinfection byproducts TTHM and HAA5. The treatment technique requires Subpart H supplies that use conventional filtration to reduce the TOC through enhanced coagulation or enhanced softening, so that TOC settles out before the disinfection is applied. However, supplies that meet alternative compliance criteria are not required to remove TOC through enhanced coagulation or enhanced softening (i.e., not required to meet the TOC percent removal requirements).

Four Methods to Comply With Treatment Technique

- A. Alternative compliance criteria (ACC). Compliance with ACC is determined quarterly.
1. Raw water TOC RAA is < 2.0 mg/L
 2. Finished water TOC RAA is < 2.0 mg/L
 3. Raw water TOC RAA is < 4.0 mg/L, raw water alkalinity RAA is > 60 mg/L, and either TTHM or HAA5 RAAs are ≤ 0.040 mg/L and 0.030 mg/L, respectively.
 4. TTHM and HAA5 RAAs are ≤ 0.040 mg/L and 0.030 mg/L, respectively and the supply uses only chlorine for primary disinfection and maintains a residual in the distribution system.
 5. Source water specific ultraviolet absorption (SUVA) RAA is ≤ 2.0 liters per milligram meter (L/mg-m). SUVA is defined as UV_{254} divided by dissolved organic carbon.

6. Finished water SUVA RAA ≤ 2.0 l/mg-m.
- B. Additional ACC for the supply that practices enhanced softening but cannot achieve required TOC removals. Softening results in:
 1. Lowering finished water alkalinity RAA to < 60 mg/L (as CaCO_3).
 2. Removing not less than 10 mg/L of magnesium hardness (as CaCO_3) measured monthly and calculated quarterly as an RAA.
- C. Step 1. The supply practices enhanced coagulation or enhanced softening to achieve the TOC percent removal levels specified in this table.^{a, b}

Source-Water TOC, mg/L	Source-Water Alkalinity, mg/L as CaCO_3		
	0-60	>60-120	>120 ^c
>2.0-4.0	35.0%	25.0%	15.0%
>4.0-8.0	45.0%	35.0%	25.0%
>8.0	50.0%	40.0%	30.0%

^aSupplies meeting at least one ACC are not required to operate with enhanced coagulation.

^bSoftening supplies meeting at least one additional ACC are not required to operate with enhanced softening.

^cSupplies practicing softening must meet the TOC removal requirements in this column.

- D. Step 2. The supply cannot achieve the Step 1 TOC removals due to water quality parameters or operational constraints.

The supply operates under alternative minimum TOC removal requirements (Step 2) or must apply to the DEQ, within 3 months of failure to achieve the TOC removals, for approval of Step 2 TOC removals. The DEQ may make Step 2 retroactive for the purposes of determining compliance. Until the DEQ approves the alternate minimum TOC removal requirements, the supply is expected to meet the Step 1 TOC removals.

Compliance Calculation Procedure

TOC removal compliance is calculated quarterly, beginning after the supply has collected 12 months of data, by determining an annual average using the following method:

1. Determine actual monthly TOC percent removal, equal to:
 $(1 - [\text{treated water TOC}/\text{source water TOC}]) \times 100$.
2. Determine the required monthly TOC percent removal (from Step 1 or Step 2).
3. Divide the value in line 1 of this section by the value in line 2 to determine the monthly value.
4. Add together the results of line 3 of this section for the last 12 months and divide by 12.
5. If the value calculated in line 4 of this section is less than 1.00, the supply is not in compliance with the TOC percent removal requirements.
6. Supply may assign a monthly value of 1.0 when any of the following criteria are met:
 - a. In any month that the supply's treated or source water TOC level is < 2.0 mg/L.
 - b. In any month that a supply practicing softening removes at least 10 mg/L of magnesium hardness (as CaCO_3).
 - c. In any month that the supply's source water SUVA, prior to any treatment, is ≤ 2.0 L/mg-m.
 - d. In any month that the supply's finished water SUVA is ≤ 2.0 L/mg-m.
 - e. In any month that a supply practicing enhanced softening lowers alkalinity below 60 mg/L (as CaCO_3).

Notes from the Surface Water Treatment Rule

A Subpart H supply must maintain a detectable residual in at least 95 percent of distribution samples each month. If the percent falls below 95 for 2 consecutive months, the supply is in violation of the treatment technique.

A Subpart H supply must measure the residual disinfectant at the entry point (plant tap). The residual shall not be less than 0.2 mg/L for more than 4 hours.